2nd Biennial Africa
Climate-Smart Agriculture Stakeholder Conference

Thematic Paper Presentation on Compatibility assessment of agroecology and CSA practices

14th September 2022

DeSIRA LIFT

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Short-term impact of ecological cropping systems on maize productivity, weed management, soil health and nitrogen fertilizer economy

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Background

- Tillage, synthetic fertilizers, and pesticides are conventional agronomic practices for higher yields.
- In smallholder systems across Africa, yields have not increased significantly under conventional cropping.
- Transitioning from conventional to alternative cropping practices is needed.

Methodology

a) In a field trial under maize in Nigeria, conventional cropping (CP) was compared with conservation (CA) organic (OA) and regenerative agricultures (RA).

a) Min. and org. N fertilizers were added to optimize the soil N status to sustain maize yields

Philosophies and description of cropping practices:

CP: tillage, fertilizer and herbicide inputs.

CA: zero-tillage, cover crop residue, fertilizer and herbicide

OA: tillage, cover crop residue and organic manure inputs.

RA: zero-tillage, cover crop residue, and organic manure

Key findings

- Maize yields under CP and CA increased by 24-31 % compared to OA and RA.
- Weed growth reduced signif. in CP and CA in the early stage of maize than OA and RA, but increased in CP than CA at the later stage
- OA and RA marginally increased the soil organic matter, but total nitrogen (N) and available phosporus (P) were slightly higher in the CA and CP.
- CA (3.5 t ha^{-1}) utilized 25 % less N fertilizer dose in providing similar grain yields with CP (3.7 t ha^{-1}).

Key Recommendations & Conclusion

- Transitioning to CA than OA & RA in the early years sustains maize yield and improves soil fertility and weed management as CP.

- Nurturing ecological cropping systems in the long-term can reduce mineral N fertilizer input in CA while enhancing ecosystem services.

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Thank you

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